<u>WHAT IS CLAIMED IS:</u>

1.   A method for establishing routing of communications via a satellite for an IP-based Demand Assigned Multiple Access (DAMA) Wide Area Network (WAN), said DAMA WAN being characterized by a bandwidth constricted control channel under control of a centralized Network Control Station for communication of channel allocation and routing information to each node in said DAMA WAN, said method comprising:

constructing a network map of all directly and indirectly connected IP network prefixes reachable via said DAMA WAN; and

allocating at said Network Control Station (NCS) communication channels via said satellite by a control channel message over said bandwidth constricted control channel directed to each involved subscriber terminal (ST) node connected to said WAN.

2.   The method according to claim 1 further including the step of:

periodically transmitting routing information whether or not said routing information has changed in order to invoke a distance vector protocol.

3.   The satellite routing protocol according to claim 2, further including the steps of:

advertising at each ST node a unique IP network prefix of a local LAN using a routing information Notice (RIN);

polling via the Network Control Station each said ST for its RIN at a periodic rate, the NCS using the RIN to send out Routing Information Summaries (RIS) to all other STs in said DAMA WAN, said RINs being used to keep all said STs aware of all other STs connected to said DAMA WAN together with their directly connected network prefixes.

4.   The satellite routing protocol according to claim 2, wherein route summarization is used, and wherein route summary information is disseminated via RIN/RIS messages.

5.   The satellite routing protocol according to claim 2, wherein specific STs are allowed to advertise routing information beyond that of its directly-connected network.

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1   6.   The satellite routing protocol according to claim 5 wherein an ST

2   running a routing information protocol, and is thus operative as a router, obtains routes-

3   available information about routes available via other routers, said routes available

4   information is forwarded to other STs via said NCS using a Terrestrial Routing

5   Information Notice TRIN, and wherein said NCS uses said routes-available information

6   to generate a Terrestrial Routing Information Summary TRIS for notification to all STs in

7   said DAMA WAN.

1   7.   The satellite routing protocol according to claim 2 further including

2   probing for other IP network prefixes reachable via said DAMA WAN using a

3   query/response process.

1   8.   The satellite routing protocol according to claim 7, further

2   including the steps of:

3   initiating a query response upon receipt by any one ST of an IP packet that

4   said ST cannot route directly and wherein said IP packet matches a supernet defined for

5   another one of said STs in said DAMA WAN: thereafter

6   generating at the requesting ST a Route Request (RR) message and

7   sending said RR message to at least all other said STs in said DAMA WAN, said RR

8   message containing an IP destination address from said IP packet that said requesting ST

9   wants to route, in order to cause each said ST search its local routing table to determine if

10   said ST can route the IP packet; if so,

11   sending via said ST a Route Notice (RN) message back to said requesting

12   ST, and

13   causing said requesting ST to enter a route for an appropriate IP subnet, in

14   order to trigger DAMA IP link request to a target ST.

1   9.   The satellite routing protocol according to claim 7 further including

2   route summarization whereby a router accumulates a set of routes into a single route

3   advertisement.

1   10.   The method according to claim 1 further including the step of:

2   updating routes via a designated router only as routes are added and

3   deleted in order to invoke a link state protocol.

4   11.   The satellite routing protocol according to claim 10, further
5   including the steps of:
6   advertising at each ST node a unique IP network prefix of a local LAN
7   using a Routing Information Notice (RIN);
8   polling via the Network Control Station each said ST for its RIN at a
9   periodic rate, the NCS using the RIN to send out Routing Information Summaries (RIS)
10   to all other STs in said DAMA WAN, said RINs being used to keep all said STs aware of
11   all other STs connected to said DAMA WAN together with their directly connected
12   network prefixes.

1   12.   The satellite routing protocol according to claim 10, wherein route
2   summarization is used, and wherein route summary information is disseminated via
3   RIN/RIS messages.

1   13.   The satellite routing protocol according to claim 10, wherein
2   specific STs are allowed to advertise routing information beyond that of its directly-
3   connected network.

1   14.   The satellite routing protocol according to claim 13 wherein an ST
2   running a routing information protocol, and is thus operative as a router, obtains routes-
3   available information about routes available via other routers, said routes available
4   information is forwarded to other STs via said NCS using a Terrestrial Routing
5   Information Notice TRIN, and wherein said NCS uses said routes-available information
6   to generate a Terrestrial Routing Information Summary TRIS for notification to all STs in
7   said DAMA WAN.

1   15.   The satellite routing protocol according to claim 10 further
2   including probing for other IP network prefixes reachable via said DAMA WAN using a
3   query/response process.

1   16.   The satellite routing protocol according to claim 15, further
2   including the steps of:
3   initiating a query response upon receipt by any one ST of an IP packet that
4   said ST cannot route directly and wherein said IP packet matches a supernet defined for
5   another one of said STs in said DAMA WAN: thereafter

6   generating at the requesting ST a Route Request (RR) message and

7   sending said RR message to at least all other said STs in said DAMA WAN, said RR

8   message containing an IP destination address from said IP packet that said requesting ST

9   wants to route, in order to cause each said ST search its local routing table to determine if

10   said ST can route the IP packet; if so,

11   sending via said ST a Route Notice (RN) message back to said requesting

12   ST, and

13   causing said requesting ST to enter a route for an appropriate IP subnet, in

14   order to trigger DAMA IP link request to a target ST.

1   17.   The satellite routing protocol according to claim 15 further

2   including route summarization whereby a router accumulates a set of routes into a single

3   route advertisement.